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Government of Newfoundland and Labrador
Department of Forestry

Providing for the future...

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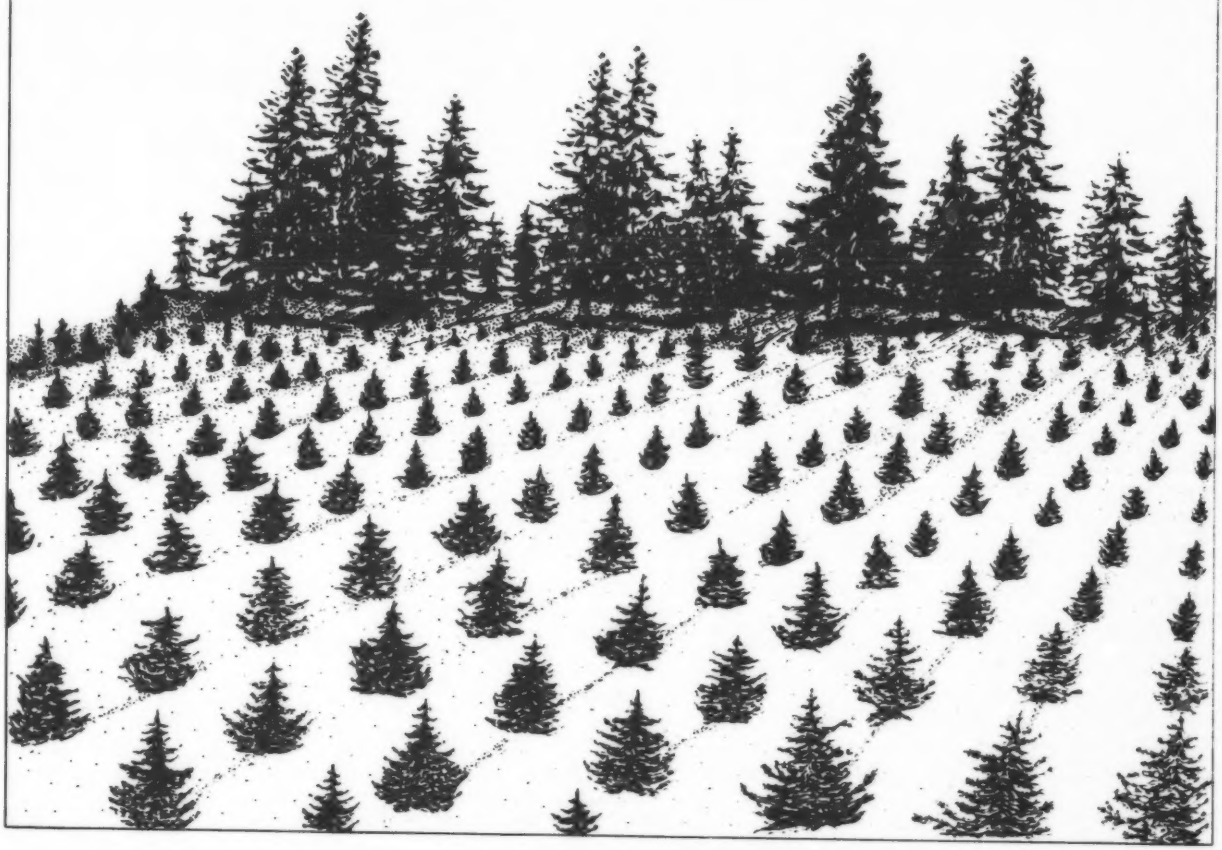


Forests are Newfoundland's forgotten resource - until they are threatened. Then the people are quick to accuse and assume nothing has been done and nothing is being done to protect an industry that employs 14,000 directly and indirectly and accounts for one third of the province's exports.

To some extent it is true that a real or perceived crisis is often necessary to galvanize government into taking action to salvage what should have been nurtured rather than squandered. It is also true that foresters are notorious for keeping a low profile and discouraging publicity at all costs so that even the most fundamental techniques within the industry remain mysterious to the casual observer.

It was perhaps just such a crisis that prompted the appointment by the provincial government of a Royal Commission to examine issues in forestry. A spruce budworm infestation at its height in 1978, coupled with an overabundance of mature and overmature timber, triggered an immediate analysis of future timber supply problems. Results pointed to a major shortage before the year 2000. The Commission's recommendations and the requirements for signing a federal/provincial agreement led the government of Newfoundland and Labrador to develop a 20-year forest management plan. Something had to be done to protect the timber supply.

The strategy was simple: ensure that forestry remains a viable industry in this province. Such an ambitious plan required money, and a sizeable portion of that money comes now in the form of a Forest Resource Development Agreement between Canada and Newfoundland. This four-year pact, signed in April, 1986 and valid until March 31, 1990, will pay for the resource management programs, research, technology transfer and informing the public of its progress, all of which are crucial elements of Newfoundland's long-term goals. The agreement is administered by a management committee representing both governments (the provincial Department of Forestry and the Canadian Forestry Service) which will continue to operate for twelve months following termination of the agreement. They plan, coordinate and monitor all initiatives under the Forest Resource Development Agreement, including the final analysis and reporting of overall achievements and results.

This pact is part of a broad group of agreements called ERDAs (Economic Regional Development Agreements) which fund projects throughout Canada. It is not the first of its kind. Rather, it builds on programs introduced under previous accords. Its predecessors were the two Canada-Newfoundland Subsidiary Agreements which injected $125 million into the industry. As a result, 56,000 hectares (one hectare is equivalent to 10,000 square meters or about 2.5 acres) of productive forest land were improved, three tree nurseries and 1,600 kilometers of access roads were constructed, a forest management inventory was prepared and forest protection capabilities were vastly improved. By 1985 the projected annual timber deficit until 2024 had been reduced by 25%.

The Forest Resource Development Agreement will infuse $48 million into forestry. Of that, the federal government's share is $33.6 million, or 70%, and the province will add $14.4 million, or 30%. Between four and five thousand seasonal and full-time jobs were also expected to be generated under the agreement. In a province of rampant unemployment such statistics can only be greeted with applause and relief.

Photo courtesy of Department of Forestry

Following appropriate site preparation seedlings provided by one of the three provincial tree nurseries are planted. Planting operations are carried out by government, private industry and some service organizations.

At this halfway mark those who administer and recommend will measure the Forest Resource Development Agreement's success and assess its actual and potential value to Newfoundland. As Canadian Forestry Service forester, **Bill Alexander,** says "we do the best we can and try not to waste the money." The dollar value of expenditures, the number of kilometers of roads built and the number of trees planted will, of course, be the yardstick, but the results amount to more than statistics.

While it may be essential for the bureaucrats to know that the 50 kilometers of access roads built or improved cost $981,348, and that $1,594,213 was spent on forest management inventory and planning within the first two years under the Agreement, it is equally important for the small contractor to find out if his interests are being protected, if he will have timber to harvest in the next five or ten, or even twenty years.

The statistics, however, are undeniably impressive. **George Ross,** Director of the Silviculture and Research Division of the Department of Forestry, says, in fact, the

Photo courtesy of Department of Forestry

The Wooddale Tree Nursery is the largest of the province's three regional nurseries. It has shipped 23 million seedlings since it began production in 1974 and expected to reach a yearly production of between seven and nine million trees.

industry is "galloping at a tremendous pace." Ross is also co-chairman of the Silvicultural Technical Advisory Committee, a sub-committee of the group which is responsible for managing the Forest Resource Development Agreement, and he feels we "don't have to be humble." Since 1979 more than 15,000 hectares of land have been planted with seedlings in the last ten years and today about 90% of all trees planted are surviving. In fact, says Ross, the rate of growth of our program is greater than anywhere in Canada and we are gaining ground on the projected timber shortage. We have an ideal climate — notwithstanding droughts such as the one experienced in 1987 — and silviculture has attained the position of importance it deserves in the "broad strategy thrust" of forest management programs being implemented under funding agreements.

Silviculture projects, the largest single component of the Forest Resource Development Agreement and constituting $26.6 million of the full amount, are divided into two main groups, forest renewal and forest improvement. The most important aspect of improvement is thinning. Projects are implemented by both governments and private industry to reduce the density of stands in which competition will prove a threat to optimum tree growth. This is particularly applicable to balsam fir, which tends to grow more densely when it regenerates naturally.

Renewal involves the artificial replacement of stands which have been depleted by logging operations, fire and insect infestation. Under some circumstances natural regeneration is common but when this does not happen new trees have to be planted.

Planting seedlings represents perhaps the most difficult of an already exceptionally labour intensive industry, with at least 80% of the money spent on planting going to wages and benefits. A few local development associations and service clubs, including the Boy Scouts, are involved in planting projects within their own areas, but the majority is carried on by industry and government, with all seedlings being supplied by three provincial tree nurseries.

The Goose Bay Nursery is one of the most northerly in Eastern Canada, and consists of four wooden frame greenhouses covered with inflated, ultra violet polyethylene and heated with oil-fired hot air furnaces. Seedlings are grown in black, ridged-walled containers containing 67 holes. They are filled with peat moss and one to three seeds are dropped into each cavity by a vacuum seeder which plants two trays at a time. They are covered with sand and thinned after a twelve day germination period. Jack pine, black and white spruce, as well as native red pine and larch are produced, comprising an annual output of 320,000 seedlings.

The Mount Pearl Nursery, which also produces container seedlings, was initially established to conduct experiments on trees for reforestation programs. Today, 550,000 seedlings are grown and shipped in two yearly crops, with the majority supplying programs in the Clarenville area.

The largest of the three facilities is the Wooddale Provincial Tree Nursery, located fifteen kilometers east of Grand Falls. Fifty hectares are currently in production, although the nursery reserve encompasses 235 hectares in total. Built under the First Federal/Provincial Forest Subsidiary Agreement, it is the only facility in the province which produces both container and bare root seedlings - young trees planted in seedbeds, nursery compartments or fields and not transplanted until they have reached two years of age. Nurturing the bare root seedlings provides stronger trees for areas where competition from hardwoods and brush will be a problem. Since it went into operation in 1974, Wooddale has shipped 23 million seedlings and yearly production has now reached about twelve million per year.

All of the seed used for seedling production in the province is processed at Wooddale's storage/extraction plant. The seed-containing cones - 27,500 litres of which were collected under the first two years of the Forest Resource Development Agreement - are placed in a kiln after which the seed is extracted, scalped, dewinged and packed for frozen storage.

The Wooddale manager, **Tom McDonnough,** is transplanted from Ontario, and agrees with George Ross in his assessment of our success in Newfoundland in the silviculture field. Money needed to run his operation comes from the silviculture budget which is dependent, of course, on the Forest Resource Development Agreement. McDonnough says running the nursery is a "very expensive proposition," and they depend on the funding agreements to live up to four year commitments.

As far as which species

Photo courtesy of Corner Brook Pulp and Paper

The results of a successful thinning operation are evident in the comparison of disks demonstrating the before the after effect. The growth rings are widened considerably following the thinning procedure.

Photo courtesy of Corner Brook Pulp and Paper

Brush saws are used in pre-commercial thinning operations by employees of both Abitibi Price and Corner Brook Pulp and Paper. This new hardware decreases the backstrain caused by chainsaw operation and is faster and more efficient. It has, however, no other industrial applications at present.

are chosen to plant, McDonnough says he treats the government and the pulp and paper companies as customers and will produce whatever they order. In 1987 that included 12.8 million trees, of which 70% were container seedlings. The majority were black spruce, with 25% white spruce and 1% pine. (The pine was supplied mainly to the Springdale area). The nursery is also a substantial employer in the area, paying between three quarters and one million dollars in salaries annually.

Planting trees, while perhaps the most familiar aspect of forest management in the eyes of the public, is just one of the functions of foresters who specialize in silviculture. Of the silviculture budget under the Forest Resource Development Agreement, the two levels of government contribute $28 million and private industry furnishes an additional $5.4 million. Under the agreement, funds percolate through the provincial system into sub-agreements with the mills.

While the industry's first objective is to minimize 'cost per cord to roadside' and maximize profit, the private sector is no less important in the forest management scheme. The fact is clearly demonstrated by the substantial contribution Abitibi Price and Corner Brook Pulp and Paper make to silviculture programs. Of course they cut wood, but they also plant trees and employ thousands of Newfoundlanders.

That may be a vast oversimplification of industry's role in the harvesting and regeneration of timber stands. The pulp and paper business was considered by many to be a "sunset industry" five years ago, says George Ross, due to competition from some of the more efficient wood suppliers such as South America. Today, the mills are alive and well and continuing to produce and export. But forest improvement technology must be continually updated. The problem with the two kinds of commercial forests in Newfoundland, (black spruce in central regions and balsam fir in the west, the Avalon Peninsula, the southern shore and up the Northern Peninsula), is one of either too many trees or not enough. As a rule, spruce need to be planted while fir stands must be thinned.

Photo courtesy of Corner Brook Pulp and Paper

Pre-commercial thinning dramatically changes a timber stand but is considered essential ...

Bill Furey, divisional forester with Abitibi Price in Grand Falls, says the most important silviculture program to industry is pre-commercial thinning. Furey says his Abitibi employees thin some areas with densities of up to 100,000 stems per hectare where the optimum number for maximum yield should be about 2000. To illustrate the dramatic increase in production of a thinned stand, Furey says Abitibi expects to triple its growth productivity over the next few years. Whereas unthinned land produced 25 cords per acre in its natural rotation age of 70 years, their silviculture projects will ensure more than 40 cords in 40 to 50 years. (A cord is a pile of wood eight feet long, four feet wide and four feet high, or the equivalent of about two pickup loads.)

Other projects include planting, herbicide application and site preparation. The optimum land conditions require a mixture of humus and soil for the seedlings, and Abitibi uses disk trenchers and cultivators to accomplish the preparation, says Furey.

Photo courtesy of Corner Brook Pulp and Paper

... by both government and private industry in promoting growth rate and increased tree size.

Abitibi is fairly mechanized, but the operations remain quite labour intensive. The company spends a great deal of the money made available under the Forest Resource Development Agreement on wages for those who are able to do the back-breaking work. To ensure the availability of wood in the future, Furey says that total reforestation costs may rise to $1600 per hectare. It's an "expensive business." With land disappearing each year to Newfoundland Hydro, agricultural development, commercial expansion, mining and recreation, the fixed land base must be carefully tended to provide the necessary increase in product for the future. With private industry licences to cut on Crown land starting to expire in 2001, and considering that only 2.8 million hectares on the island are productive, it is especially important to safeguard the resource, says Furey.

He calls it "the cost of doing business," and is pleased with the help they get from the Forest Resource Development Agreement. "They are not make work programs," he says; "we are spending money for tomorrow. Nature will do the rest."

Wayne Brown, supervisor of silviculture at Corner Brook Pulp and Paper, says that under a cost-shared agreement, the province and his company spend $2.5 million yearly. The main thrust of their program is the same as that of Abitibi. The company must be concerned with immediate supply problems so it spends the bulk of its silviculture dollar in pre-commercial thinning oper-

ations. Brown says they carry out the largest thinning program in Canada, at least in part due to a climate that promotes high tree densities.

The work is carried out by employees with brush saws, the latest technology in tree thinning. They allow cutting to be performed without excessive bending and are therefore easier to use and more efficient. They are also more expensive than chainsaws. Operators who run thinning operations for the government are less likely to own brush saws since the work is not necessarily continuous and the saw has no other use, such as cutting firewood for home heating.

While Corner Brook Pulp and Paper plants between one and two million trees per year, the projected shortage just 25 to 30 years away must be approached from the direction of thinning and more efficient harvesting of the existing stands, says Brown, and the company is quite pleased with the help it gets through the agreement. Brown sees it as the most productive form of incentive for the private sector of the forestry industry. He is quick to point out, however, that management techniques are as important to business as they are to government and with or without regulation a good deal of planting and thinning would be carried on.

Gander based **Ed Blackmore,** supervisor of forestry with the province, agrees with Brown that the Forest Resource Development Agreement is a vital link between the two levels of government and the private sector. Typical of a forester, however, Blackmore has little patience with the paperwork that inevitably accompanies so complex an agreement and its administration. "I've never seen so much paper in my life," he says. "We get obsessed with keeping it off our desks."

Blackmore would also like to see longer term agreements which would allow planning further into the future. "We're on a roller coaster," he states. If the agreement was to terminate without replacement, the provincial government would be forced to "come up with the money" to complete in-progress silviculture projects.

On the other hand, the changes since 1975 are "tremendous," and the agreements have allowed the province to function effectively. Blackmore's region, which includes the area from Baie Verte Junction to Terra Nova Park and including the South Coast, gets about half of the available funds, and he says every dollar is well spent. But we "have a lot to learn silviculturally." He says Germany is using new technology to utilize faster growing timber and would like to see industry in Newfoundland make some changes to streamline their operations. Meanwhile the money is spent on projects chosen for their geographic and market potential. That is, says Blackmore, the programs are geared to maximize productivity.

There exists a delicate and essential balance between government and the private sector in the field of forest management. They are adversaries and allies. While some controversy has arisen out of the amount of land the mills virtually possess for their use and the land tenure system itself, foresters within the industry say they need every hectare to keep their businesses thriving. The taxpayer, on the other hand, has an obligation and right to know how Crown lands are being maintained and used by industry, which is, in effect, a tenant with cutting rights.

In essence, the bottom line for the companies must be black; they must show a profit or they cannot continue to exist. Such a scenario would prove devastating to the economy of a number of Newfoundland's towns, as was graphically demonstrated when Corner Brook experienced the uncertainty of finding a replacement operator for Bowater.

The province therefore makes certain concessions to the mill owners. Previous agreements have helped them build access roads to more productive stands, although the most recent agreement supports construction of roads on Crown land only.

This is not a one-sided relationship, however. Newfoundland is not wealthy enough to support state-funded research into harvesting techniques and product development. Forest industries must compete in a sophisticated, unforgiving world market. Brazil can grow trees faster and more cheaply than we can. Germany can make paper with wood we do not bother to harvest on a large scale. It becomes the responsibility of the private sector to keep up, technologically and in the area of resource management.

Photo courtesy of Corner Brook Pulp and Paper

High flotation tires on harvesting machinery allow operators to reach previously inaccessible timber stands. Like its smaller relative, the all-terrain vehicle, skidders and forwarders equipped with these tires can negotiate steep hills and even bogs.

While the paper mills in Newfoundland are mechanized to a certain extent, the industry remains a labour intensive one. Subtle pressure from a government fighting rampant unemployment may be gently nudging in a backward direction, but according to Bill Furey a lack of manual labour will surely lead to further mechanization. Workers do not want to perform the kind of labour involved in many of the field projects. Whether machines are to be desired or resisted is a matter for experts to debate. The industry will support only that level of mechanization it can afford and only that level which

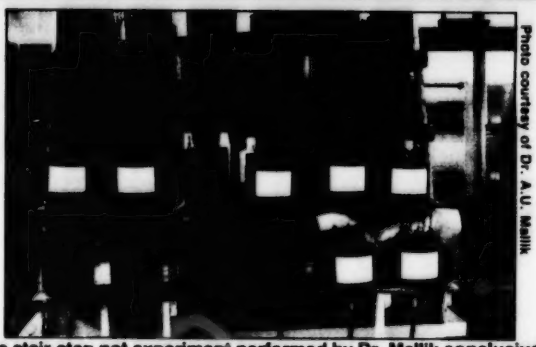


Photo courtesy of Dr. A.U. Mallik

This stair-step pot experiment performed by Dr. Mallik conclusively shows the effects of Kalmia on black spruce and larch. Plastic funnels connect vertical rows allowing the leachate (liquids percolated through soil) from each pot to filter into the next.

the people and government can live with.

The movement we are seeing is in the direction of maximizing productivity rather than finding new, virgin stands and moving farther and farther afield. Skidders and forwarders used in harvesting have been around for a number of years but innovations are making harvesting methods more efficient. High flotation tires, for example, make it possible to traverse bogs and climb steeper grades than ever before, and do it in an environmentally safe manner. **Barry Garland,** director of forest products development with the provincial department, says these tires, between 43 and 50 inches wide, are mounted on the skidders or forwarders and are becoming more common in Newfoundland. Another important innovation not yet in use but promising for the near future is the miniaturized version of equipment now in operation in British Columbia. One such machine is the small cable logger which can be fitted to the back of a tractor or skidder, says Garland.

The introduction of new methods such as these would fall under the heading of technology transfer, which cost $177,829 in 1986 and 1987. In the research area of technology advancement, Garland says one aspect of the work is species diversification. Willows and larches, for example, are being tested to see if they can provide the required biomass, or bulk growth, to be commercially viable. While the willow grows quickly it is virtually useless to the mills. Larch does not do as well but is a viable softwood. With industry relatively slow to develop methods to process new types of wood, government is somewhat restricted in its pursuit of this type of research, but with projected shortages and the cost of regenerating stands of traditionally used timber, it is evident that compromises on both sides are in order. "We have to balance doing things and looking into things," says Ross.

The trials, pilot projects, tests and technology transfers are paid for mainly by the Forest Resources Development Agreement, says Garland, and while it is at the "purely research level" right now, any or all of the possibilities may become viable alternatives to existing processes.

Federal/Provincial agreements have also supplied $2 million to install a mainframe computer at the provincial forestry department headquarters in Corner Brook and a number of workstations in the form of on-line microprocessors throughout the province. The programs, supplied by Newfoundland and Labrador Computer Services, allow computerized mapping and geographic information systems (GIS), quick collection and distribution of data on allowable cuts, wood volume, rate of forest growth, progress of silviculture and land ownership. Upgrading of the department's data base is another important achievement. Like any big business, the computer streamlines the organization and allows work to be done more quickly and efficiently.

Another major expenditure under the agreement is the construction and maintenance of access roads, with a target set at 190 kilometers. The period of maturity of a tree has a broad range, says Garland, so building roads to mature stands while bypassing seemingly more attractive young timber is the standard procedure. The agreement does not fund basic operating costs, which include building roads to actual stands. Rather, access is provided between a number of merchantable stands in the form of capital access roads, and private operators wishing to harvest must get to the trees themselves, says Garland.

Before a road is built, says Bill Alexander, there is much to consider. The appropriate committee looks at the cost of construction, how much productive forest land and merchantable wood fibre will be accessed and possibilities for recreation - whether berry picking or snowmobiling can be added to the advantages - are all carefully discussed and weighed before funds are allocated.

Some of the money spent in this manner can be recouped by charging higher stumpage rates - payment for cutting timber - to operators in areas which are served by access roads. Lower rates are available for damaged stands and, of course, if the company builds their own roads, says Garland. "There is enough wood there if everyone works at it," he states. "If we do a better job of managing our resource, if we put in our roads properly, if we lay out blocks properly, if we put the proper enforcement in place, bring our silviculture programs up and diversify, we have a bright future."

Another vital aspect of that management referred to by Garland is the control of vegetation which competes with merchantable trees for nutrients and space. Laboratory research in this area is performed in St. John's at the Canadian Forestry Service laboratory by **Dr. Azim Mallik.** Both government and private industry engage in the more theoretical variety of silviculture research, and many say it is our best hope for the next generation.

Photo courtesy of Dr. A.U. Mallik

This experiment of Dr. Mallik's shows the dramatic reduction in size of black spruce seedlings that must share their habitat with kalmia. Dr. Mallik considers kalmia to be a significant threat to Newfoundland timber stands, particularly in the central region.

Looking ahead is not something we as a species do well. Traditionally, if we cannot see results in our lifetimes we are not particularly interested in supporting causes. As Ross said, "The industry has picked up its feet...but it needs to do more research." The tide is, however, turning. The most dramatic acceptance of scientific research is in the field of medicine and that is hardly surprising when we consider that disease will touch each of us in some way, but the work being performed in less glamourous settings is in many ways as vital to our survival.

Mallik is examining an issue which is relatively new and not widely publicized. The problem is a plant which is tough, sturdy, energetic and dangerous - *kalmia*. Known throughout the province by its more common name, lambkill, *kalmia* has virtually taken over some timber stands, particularly in central areas on the island, and threatens a disturbingly sizeable portion of the province's woodlands. In fact, says Mallik, it is the "most abundant forest undergrowth species of this region, particularly in more open stands of black spruce ... and dominates extensive areas of open heathland in Newfoundland." Commercial blueberry fields are similarly effected but frequent burning is possible for plants which reach maturity in relatively short time spans, says Mallik.

Through experimentation at the Canadian Forestry Service greenhouse in Mount Pearl, Mallik has shown that *kalmia*, which produces a dense, bushy thicket within five to ten years, not only competes physically for the nutrients and land, but produces chemical substances which strongly inhibit the growth of black spruce, the most valuable of the pulp woods. One of the possibilities being considered by him is the introduction of a fungus to black spruce seedlings in the nursery setting. The fungus infects the small trees and equips them with the tools to withstand an attack from *kalmia*. The fungi being examined are species specific. That is, they would effect only black spruce, and offer the advantage of having nothing to do with the physical environment in which the trees grow. Further, the land would not be affected by such a process, only the black spruce themselves.

A second option is site preparation. This would involve cutting and burning appropriate areas to destroy the *kalmia*. Unfortunately, experiments have been conclusive in demonstrating that *kalmia* grows quite well following a fire and thus has taken out of the foresters' hands one of the tried and true methods for preparing a site for planting.

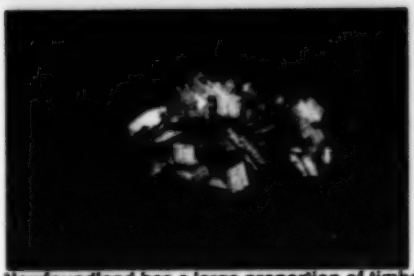
The third possibility for controlling *kalmia* is the use of chemical herbicides. The problem is finding an effective agent against the thick, waxy cuticle that covers the plant's leaves. Mallik is attempting to find a chemical agent that will allow the herbicide to penetrate this tough coating to work on the foliage. Another alternative might be a compound that is absorbed through the roots. Mallik is quick to point out, however, that relatively little is known about many of these substances, and while chemical companies assure us their particular products disappear from the soil within weeks or months, healthy scepticism is desirable before choosing this method.

Without the Forest Resource Development Agreement Mallik would not be conducting his research. He would like to see even longer commitments that would permit extended experimentation in the areas of soil treatments and long-term growth studies but is nevertheless pleased that the province is becoming increasingly aware of concealed dangers. The public is quick to panic at an insect infestation, but the growth of a plant over a number of years that is native to this province seems somehow less threatening.

In other Canadian centres more unusual types of research are being performed in the area of biotechnology. Techniques in gene splicing, cellular reproduction (cloning), and designing living organisms to meet specific needs are often relegated by the public to the realm of science fiction, but it is fast becoming fact. Corner Brook based geneticist Dr. Charles Harrison is one of the scientists who uses the Forest Resource Development Agreement funding to conduct such 'exotic' forms of research.

The problem is, of course, we are speaking of growing trees, not bacteria. They take decades to mature and experimentation is necessarily a laboriously slow process. This fact works against our forests from the private sector's point of view, as well. Tying up money and resources in speculative ventures that may take 70 years to come to fruition can be difficult to justify. One answer to the problem, say government foresters, is to tailor utilization methods to our forest products, not vice versa. In other words, we are doing things backwards.

Millions of dollars are spent trying to regenerate timber stands because industry demands a specific species that it finds works well for any given process or product. Foresters now see the key may be to change



Woodchips are proving a promising source of energy for the province.

Newfoundland has a large proportion of timber stands unusable in the pulp utilization of forest products.

Photo courtesy of Department of Forestry

Wood chips can be produced and loaded into hoppers at a rate of 0.93 cubic meters per minute. This alternate energy source is the newest technology developed under the FRDA to better utilize forest resources.

Photo courtesy of Department of Forestry

The helitorch is used to facilitate site preparation through prescribed burning. While this is one of the most common methods of preparing a site for reforestation, one of the inherent dangers is not out of control fire but rather the introduction of competing plants such as kalmia.

the technology to use the resources that are available and currently not merchantable, rather than attempting to replace a slower growing or more wasteful tree that is convenient for a given industry.

Some movement can be seen in that direction as a wider variety of species is being tried in different areas. Where black spruce will not grow well perhaps pine is the answer, and if industry can use the pine that is produced in half the time then it would seem a more reasonable route to take. There is some testing carried out on a very small scale with exotic varieties of trees, as well, but in the main, silviculturalists are attempting to maximize the resource's potential by matching soil conditions, climate and industry demands to the most appropriate species.

The view that we are guilty of treating trees as nothing more than possessions, or objects to be used at our leisure with or without discretion for our convenience and profit, is outdated and totally inaccurate. Newfoundland has every right to be pleased with its progress in the area of forest management.

Awareness may have been heightened initially because of increased consumption due to high oil prices. The use of wood for heating homes has reached an all time high with 800,000 cubic meters of timber consumed annually, and there was concern expressed that this informal harvest was not properly managed and the forests could not support this added depletion. In fact, only 45% of insular Newfoundland is productive woodland, indicating just how much forest is unusable by either sawlog operators or pulp and paper mills. Insect damaged stands, poor quality timber and the leftovers from logging operations - low value cutovers and slash - can be valuable commercial sources of energy and Newfoundland is beginning to cash in. The Forest Resource Development Agreement is instrumental in the development of new techniques which encourage fuller utilization of formerly 'useless' timber.

In 1978 Abitibi Price in Grand Falls began burning woodchips to produce heat required to make paper. Since then, the mill at Corner Brook added the process, the Gander and Western Memorial Regional Hospitals began to heat their facilities with this method, and now Newfoundland Hydro is proposing a 4.5 megawatt woodchip fired electric generating station in Roddickton. The plant will begin in 1989 to burn about 25,000 cords of wood annually.

With the implementation of the $26 million operation at Roddickton, which will provide electricity for Roddickton, Main Brook and St. Anthony, sixteen full time jobs, and the wide use for heating purposes in many of our largest institutions, it is clear that woodchips are perhaps a viable alternative in the energy crunch. Expenditure under the agreement in the area of technology transfer is certainly justified as preliminary investigations are conducted into the potential for large scale wood fired electricity generators.

The technology for the process was developed in Sweden, which has climatic conditions and forestry economics quite similar to Newfoundland's. The machinery includes a 4900 kilogram chipper which shreds timber, a feed unit that loads wood on a conveyer belt leading to the chipper, the drive asembly or diesel engine which powers the vehicle, and a chip bin for storing the finished product. It is able to fill a fourteen cubic meter hopper in fifteen minutes.

Also falling under the Forest Resource Development Agreement umbrella is the adoption of new technologies in fire detection, control, mapping and record keeping. A lightning detection system will be introduced to Newfoundland and the air tanker fleet will be upgraded.

Four CL-215 Canadair water bombers were recently purchased under a separate agreement between Transport Canada and the provincial government. Such hardware is perhaps the most visible sign to the public that money is being spent in the all important area of forest protection.

To the small operators the Forest Resource Development Agreement is bread and butter, with all projects under the agreement being awarded by means of public tender. H. & R. Enterprises Ltd. of Chapel Arm, for example, received a $47,500 contract to carry out pre-commercial thinning on 80 hectares at Hamilton's Pond in the Green Bay District, while Triple R. Contracting of Port Anson prepared 60 hectares at Boot Harbour for $29,340 and 50 at Chasm Hill, Green Bay, at a cost of $24,450.

Whatever the reason for our awakening interest in forest management, increased public knowledge and the recognition of this issue as worthy of in depth consideration will ensure a bigger piece of the tax dollar for research and silviculture projects in the province. To attain that goal the Forest Resource Development Agreement allocates funds for communicating its intentions and accomplishments.

George Ross says his profession is "beginning to climb out of a trough. We're no longer the good guys nor the bad guys; we're just guys, and we've got to talk to the public. The taxpayer doesn't care which type of level bureaucrat looks after the forest as long as it's looked after."

FOREST RESOURCE DEVELOPMENT AGREEMENT